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AMARILLO TECHNICAL TRAINING CENTER (ATC)
AMARILLO AIR FORCE BASE, TEXAS

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DEVELOPMENTAL REPORT

"PREDICTING AIR FORCE RECIDIVISM
BY THE
MMPI TEST-RETEST!"

BY
B. C. GRAVES, PH.D.

JUNE 1963.



ACKNOWLEDGEMENTS

This project is a coordinated part of the total research efforts of the 3320th Retraining Group. Assistance in conduct of this study is acknowledged for the following staff:

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FOREWORD

The ramifications of this Study extend beyond the implication of the Title. In addition to modest offense recidivism predicting claims, the data amply demonstrate that, in the brief (four months average) but intensive rehabilitative exposure in the therapeutic community of the Retraining Group, there is an impact, and that the change is in the more socialized and less debilitating direction.

The data also implies that the fraction of retrainees not restored to duty is similar to, but yet more abnormal in personality than, the restored retrainees who subsequently failed to complete their enlistment. From this we assume that this non-restored group contains a larger number who would not have succeeded had they been restored. Treatment and valid disposition of selected Air Force prisoners is the primary assignment of the Retraining Group. Thus the Study serves as an indirect validation of the overall restoration function of the Retraining Group and a confirmation of its usual decision regarding restoration or non-restoration.

A further study of the basic data demonstrates that, under the conditions that pertain, the Retraining Group does usually return to duty without subsequent repetition of offense those selected offenders who deviate even rather markedly from the norm. But if the personality deviation is still more severe or extreme in extent, even though marked amelioration is achieved, this is usually not in an absolute sense sufficient recovery by which to predict non-repetition of offense

upon return to duty. Thus, the restoration entrance criteria should continue to exclude the least amenable. Nevertheless, there is personality inventory evidence that prisoners, having entered Air Force Retraining but not being restored, enter civilian life with less personality deviation than they might have, had they been returned without Retraining. This is a secondary aim of Air Force Retraining.

Most investigators have been too impatient or lacking in confidence in adequate average therapeutic change in their population to use "before" and "after" personality inventory prediction as has Dr. Graves. This is especially true in populations generally lacking in anxiety and without time in which to develop extended personal relationship with the therapist. This Study, in finding the potential value of "before" and "after" measurable personality relationships in corrections, opens the door for extensive, multi-variable prediction in this realm.

The investigation also provides a basis for challenging the oft-repeated thesis that moderate to severe character and behavior disorders are basically not amenable to treatment. In a well-staffed and organized therapeutic community, short-term, intensive treatment can result in clinically obvious and psychometrically demonstrable personality change.

The Study also highlights the feasibility of test data predictions in personnel selection and recruitment. Such investigations

bring us closer to the ultimate goal of prevention, rather than treatment, of unlawful and anti-social behavior.

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INTRODUCTION

The purpose of the present study is to investigate the potential capacity of the Minnesota Multiphasic Personality Inventory (MMPI) test-retest differential to predict recidivism among a group of Air Force prisoners restored to duty from the 3320th Retraining Group during the year of 1960. This represents an extension of an investigation (Graves, 1961) into the capacity of a single MMPI to predict Air Force recidivism. In the 1961 study, it was found that an MMPI given at the beginning of treatment did not sufficiently differentiate successful from unsuccessful restorees, although two scales of social responsibility (SR) and validity (F) showed significant differences beyond the .05 level.

The history of the attempt to predict recidivism by objective measures is quite extensive and had its inception as early as 1920. Schuessler (1954) has aptly covered the history of parole prediction up to 1954. This study presents only some of the major contributions on prediction of recidivism.

Warner (1923) investigated single background factors in the predictions of success or failure on parole and found only a limited relationship. Hart (1924) improved on Warner's method by combining background factors into a prognostic score. Burgess (1928) developed a table of expectancy rates for parole violation and nonviolation. Advanced prediction instruments were developed by Sheldon and Eleanor Glueck in 1930. Through statistical techniques they weighed favorable

background factors in relationship to success or failure to set up their prediction tables. Laune (1936) emphasized the importance of considering the effects of treatment on prediction of recidivism. Tibbitts (1931) found that predictions based on one prison population were not always consistent with another. Ohlin (1951) maintained that experience tables should be continuously adjusted.

Within the past few years, there has been a tendency by correctional, educational and military psychologists to use the MMPI or other objective personality measures for predictive purposes. Hathaway and Monachesi (1951) and Glueck and Glueck (1960) used the MMPI to identify predisposed and youthful delinquents. Multiple variables of the MMPI were used by Remple (1958) in the classification of delinquent and non-delinquent high school boys. The Pardon and Parole Commission of Ohio began using a constellation of MMPI variables derived by Dr. John Pruski in 1961 and the Youth Authority and Department of Corrections in California have begun an extensive program establishing "base expectancy" scores which are to be used in parole selection when they become standardized and perfected (Evjen, 1962).

Much effort was expended by military psychologists during World War II to find predictors which would identify successful pilots, navigators, unsuitables, etc. Personality inventories such as the MMPI were found to have little predictive capacity for identifying certain military criteria (Cronbach, 1947). Since World War II, the United States Air Force and the other military services have carried

on research relative to selection, training, and prediction of success of inductees, using objective personality tests, biographical inventories, and psychiatric, social and psycho-social variables. Some of the more important studies include prediction of separation of Air Force trainees (Force and Meyers, 1959), prediction of unsuitable discharges (Fisher, Ward, et al, 1960), and unsuitable airmen (Flyer, 1961). Leventhal (1960) demonstrated that the MMPI could differentiate among groups referred for psychiatric evaluation because of impending Article 15, court-martial or separation. Apparently, no study has attempted to evaluate the recidivism prediction capacity of the MMPI test-retest differences, especially in a military setting.

Hypotheses to be Tested

The hypotheses were based on the principle that personality changes are not likely to occur among a population of character and behavior disorders during or following treatment. Hathaway and McKinley (1951, p. 20) state that "No therapy is especially effective in improving persons with high psychopathic deviate (Pd) scores," and Fenichel (1945, p. 537) points out that "Analytic therapy in the case of character disorders meets with specific difficulties." The two groups of restorees, successful and unsuccessful, presented MMPI profile scales in which the two most elevated MMPI scales were generally psychopathic deviate (Pd) and hypomania (Ma). Such elevated scales are described as typical of behavior and character disorders in the Atlas for the MMPI (Hathaway and Meehl, 1951). The hypotheses to be tested are therefore:

Hypothesis I. No significant differences are expected to exist between the first and second MMPI scores on any of the 17 scales for either the successful group or unsuccessful group of restorees.

Hypothesis II. No significant differences are expected to exist between the MMPI scores of the successful and unsuccessful restorees on any of the 17 scales for either the first test or the retest of the MMPI.

METHODS AND MATERIALS

Subjects

Two groups of subjects were randomly selected from among the 220 male prisoners (retrainees) of the 3320th Retraining Group who were restored to duty during 1960. One group comprised 35 restorees who had been successful¹ at least from restoration to the study cut-off date of January 1, 1962, a period not less than 12 months. The other group was made up of 35 restorees who failed² within the same deadline period. The mean age of the successful group was 23 years with range of ages from 17 to 40. The mean age of the unsuccessful group was 22.3 years and the range of ages was from 17 to 40. The incidence

¹ Successful means that the resotree got into no further difficulty in the Air Force and/or completed his tour of duty with honorable discharge following restoration to the cut-off date for the study of January 1, 1962.

² Failure or unsuccessful means that the resotree was discharged under Air Force Regulations of unsuitability 39-16, undesirable 39-17, bad conduct discharge 39-18, etc., within the interim period following restoration.

of AWOL, larceny, and "other offenses" was about equal for both groups. The average length of time on duty after restoration for each group was 18 months.

Materials

The MMPI test-retest was used as a personality measurement.³ Each restoree had taken both tests during his rehabilitation period at the Retraining Group. The mean number of days between tests for the successful group was 55 days with range from 37 days to 75 days. The mean number of days between tests for the unsuccessful group was 54 days with range from 36 days to 78 days. Only valid MMPI tests were used for the study. The scales used were 3 validating scales and 14 personality scales of the MMPI. The validating scales are: lie (L), validity (F), and defensiveness (K). The personality scales are: hypochondriasis (Hs), depression (D), hysteria (Hy), psychopathic deviate (Pd), masculinity-femininity (Mf), paranoia (Pa), psychasthenia (Pt), schizophrenia (Sc), hypomania (Ma), introvertiveness (Si), dominance (DO), Taylor Anxiety (TA), Barron Ego (HE), and social responsibility (SR). All measures were based on K-corrected T scores. The data yielded by the MMPI test-retest were of such nature to make t tests of significance between correlated means appropriate (McNemar, 1954).

³ The criteria for restoration of the restorees were based on decisions by three correctional classification boards. Psychological tests are used by the psychologist, but they are used in conjunction with other factors to evaluate the Retrainee's Air Force potential. It is, therefore, assumed that the MMPI contributed only a fractional part of the total variance for restoration.

RESULTS

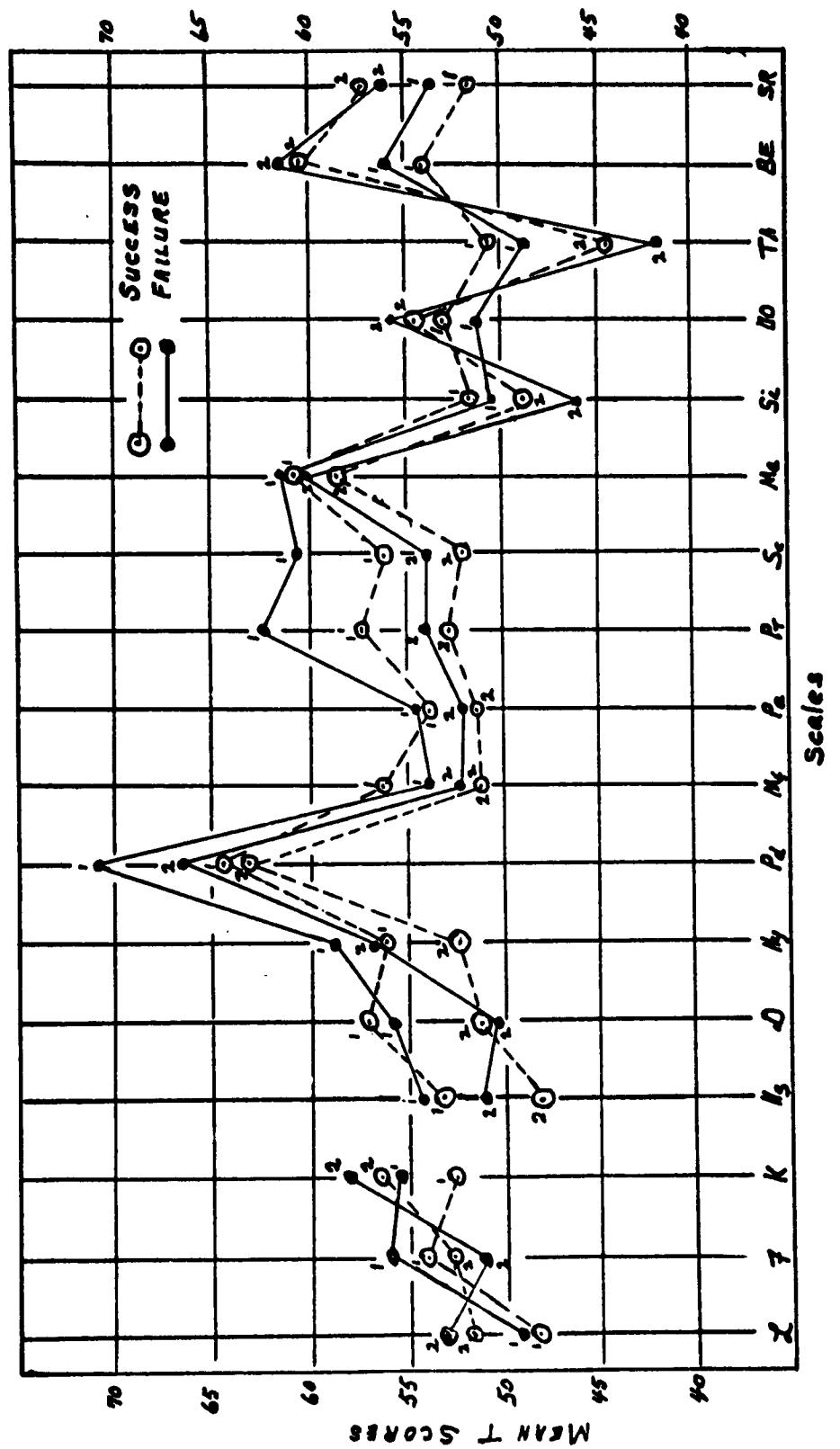
Test-Retest Differences within Groups

Successful restorees revealed significant test-retest differences (.05 level) on nine scales of the MMPI. As shown in Table I, these scales were: (L), (K), (Hs), (D), (Mf), (Pt), (TA), (HE), and (SR). Unsuccessful restorees reflected significant differences on ten scales (F), (Hs), (D), (Pd), (Pt), (Sc), (Si), (DO), (TA), and (HE) as shown in Table II.

It will be noted that both successful and unsuccessful restorees made changes in the same direction on five common scales: (Hs), (D), (Pt), (TA), and (HE). In addition, no significant changes occurred for either group in the test-retest on common scales of (Pa), (Ma), and (Hy). Contrasting both groups, however, were the significant differences on the remaining nine scales. For the successful group, significant differences were found on increase (L), (K), (SR), and reduction on (Mf) of the second test; whereas, unsuccessful restorees revealed significant changes on the second test toward reduction on scales (F), (Pd), (Sc), (Si) and increase on (DO).

Differences between Groups on the First Test and Retest

Comparing the mean T scores of successful with unsuccessful restorees on the first test only, Table III, one scale (Pd) was significant at the .05 level. On the second test, only the scale of (Hy) differentiated between successful and unsuccessful groups at the .05 level of confidence.



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Figure 1

MEAN T SCORES OF THE MMPI TEST-RETEST OF SUCCESSFUL AND UNSUCCESSFUL RESTOREES

TABLE I

COMPARISON OF CHANGES OF SUCCESSFUL (SR) RESTORERS
ON SEVENTEEN SEPARATE SCALES OF THE MMPI TEST-RETEST
SHOWING MEANS, STANDARD DEVIATIONS, MEAN DIFFERENCES^a,
AND t RATIOS OF T SCORES (N=35 MALES IN EACH GROUP)

Scale	FIRST TEST			RETEST			t Ratios
	Mean	St Dev		Mean	St Dev	Mean Diff	
L	48.8	6.78		51.7	6.83	-2.9	2.50*
F	53.7	6.26		52.7	5.93	1.0	.01
K	52.6	8.10		56.1	7.08	-3.5	2.50*
Hs	53.3	10.41		48.2	6.08	5.1	2.84**
D	56.7	10.68		50.7	8.61	6.0	2.68*
Hy	55.8	8.24		52.2	7.15	3.6	1.88
Pd	64.6	9.75		63.2	9.06	1.4	.70
Mf	56.0	9.98		51.3	7.44	4.7	3.36***
Pa	53.8	7.85		51.7	7.34	2.1	1.00
Pt	57.3	10.36		52.7	8.17	4.5	2.35*
Sc	55.9	9.65		52.5	4.62	3.5	2.00
Ma	60.9	11.14		59.0	9.26	1.9	1.19
Si	50.5	7.76		48.7	9.62	1.8	1.03
DO	52.9	8.34		54.2	7.25	-1.3	.70
TA	50.5	7.64		44.4	9.61	6.1	4.25***
BE	54.2	6.96		60.4	5.81	-6.2	4.74***
SR	51.7	10.34		56.2	10.30	-4.5	2.62*

^aMean difference is the First Test less the Retest, with negative values given in certain cases.

* at .05 level

** at .01 level

*** at .001 level

TABLE II

COMPARISON OF CHANGES OF UNSUCCESSFUL (UR) RESTOREES
ON SEVENTEEN SEPARATE SCALES OF THE MMPI TEST-RETEST,
SHOWING MEANS, STANDARD DEVIATIONS, MEAN DIFFERENCES^a,
AND t RATIOS OF T SCORES (N=35 MALES IN EACH GROUP)

Scale	FIRST TEST			RETEST			t Ratios
	Mean	St Dev		Mean	St Dev	Mean Diff	
L	49.1	7.04		52.2	7.25	-2.1	1.41
F	56.9	7.88		51.9	6.65	5.0	4.77***
K	55.6	8.01		58.7	9.85	-3.1	1.72
Hs	54.4	7.40		51.2	7.14	3.2	2.64*
D	55.5	12.92		50.4	9.15	5.1	2.25*
Hy	58.7	8.09		56.5	7.00	2.2	1.40
Pd	70.8	11.23		66.5	7.94	4.3	2.68*
Mf	53.6	9.04		52.0	6.04	1.6	1.16
Pa	54.5	11.53		52.2	7.40	2.3	1.20
Pt	62.6	12.92		54.2	7.01	8.4	4.34***
Sc	60.7	12.17		54.0	8.53	5.7	3.54**
Ma	61.3	10.45		60.5	10.98	0.8	.56
Si	50.4	11.09		46.0	8.84	4.4	3.09**
DO	51.2	8.77		55.6	11.11	-4.4	3.32**
TA	48.5	11.18		41.6	11.12	6.9	2.87**
BE	56.2	7.26		60.8	6.63	-4.6	3.65***
SR	53.6	8.28		56.0	9.48	-2.4	1.83

^a Mean difference is the First Test less the Retest, with negative values given in certain cases.

* at .05 level

** at .01 level

*** at .001 level

TABLE III

DIFFERENCES OF MEAN T SCORES AND t RATIOS
BETWEEN SUCCESSFUL (SR) AND UNSUCCESSFUL (UR)
RESTOREES ON 17 SCALES OF THE MMPI TEST-RETEST

Scale	(SR) VERSUS (UR) ON FIRST TESTS		(SR) VERSUS (UR) ON RETESTS	
	Diff. Means	t Ratios	Diff. Means	t Ratios
L	.34	.213	.48	.281
F	-3.19	1.910	- .83	.542
K	3.03	1.553	2.64	1.269
Hs	1.08	.493	3.00	1.864
D	-1.20	.415	- .32	.145
Hy	2.83	1.430	4.25	2.470*
Pd	6.23	2.450*	3.29	1.590
Mf	-2.42	1.048	.66	.401
Pa	.72	.299	.43	.240
Pt	5.37	1.890	1.49	.807
Sc	4.80	1.804	1.51	.561
Ma	.49	.186	1.54	.644
Si	- .01	.004	-2.71	1.079
DO	-1.72	.828	1.37	.706
TA	-2.04	.877	-2.77	1.099
HE	2.00	1.158	.43	.270
SR	1.92	.844	- .20	.088

Mean difference is the (UR) mean T score less the (SR) mean T score, with negative values given in certain cases.

* at .05 level

A Comparison of the MMPI Profile Scales

A comparison of the MMPI profile scales for both groups on the first and second tests are shown on Figure I, graphic form, and in tabular form on Table I and Table II. An inspection of the graph shows that, in general, the unsuccessful restorees scored higher mean T scores on both the first and second tests in the direction of greater abnormality than successful restorees, particularly on the scales of (Pd), (Sc), and (Ma), which are described as typical of delinquent behavior (Hathaway and McKinley, 1956; Glueck & Glueck, 1959; Hathaway & Monachesi, 1957; Remple, 1958). Although the failure group presented more disturbed looking MMPI profiles than successful restorees on the first and second tests, only the (Pd) was differentiating on the first test and the (Hy) scale on the second test.

DISCUSSION

The main question to be answered from the results of this study are: Does the MMPI test-retest offer potential capacity to differentiate successful from unsuccessful restorees among the population studied: Hypothesis I is rejected in that nine or more significant differences were found on the test-retest scales of each group of restorees. On the test-retest within groups, successful restorees differed significantly on scales (L), (K), (SR), and (Mf), whereas unsuccessfuls on the second test differed significantly on scales (F), (Pd), (Sc), (Si) and (DO). These differences offer the possibility of using combinations of MMPI scales for prediction of recidivism,

whereas single predictors as used in this study have limited predictive efficiency (Guilford, 1950). Using either the first or second test, it was found that only two scales differentiated between successes and failures at the .05 level. Since this could have been due to chance, Hypothesis II could not be rejected; that is, no significant differences could be demonstrated between groups on the test-retest. In brief, a single MMPI test has little value in differentiating successfuls from unsuccessful restorees, using single predictors.

Of special interest was the incidental finding of an apparent L-F-K relationship for each group of restorees on the first and second MMPI tests. On the first test both groups presented $F > L$ and $F > K$, (a "caret" shape). On the second test both groups presented $L > F$, $K > F$ (a "V" shape). The difference is that on the second test successfuls significantly raised (L) and (K) and kept (F) fairly stable, whereas unsuccessful restorees lowered (F) significantly without significant increase on (L) and (K). The L-F-K relationship findings are of theoretical and practical importance to psychologists working with groups of behavior and character disorders. Two questions arise: (1) Are the significant differences which appeared on the L-F-K test-retest for each group of restorees due to dissimulation; (2) Are the changes on the L-F-K relationship due to the treatment effects of the rehabilitation program which they completed? As to the first question, Gough (1950), Drasgow and Barnette (1957), and Cofer (1949) have shown that Subjects faking a "good impression" typically present a lower F and a much higher (K) than controls; that is, F minus K was quite negative

in score. Behavioral disorganization and disturbance are typically shown by an elevated F scale (Gross, 1959). Heilburn (1961), feels, however, that an elevated K scale is a sign of good health for adjusted subjects of a normal population but is defensive for abnormal population. The interpretations of the cited studies on the theoretical implications of the L-F-K relationships which they found cannot be fully applied to this study since their subjects were not in the main character disorders nor was the MMPI test-retest given in all cases.

Relative to the second question, it has been found that the MMPI test-retest has been used as a measure of response to therapy. Gallagher (1953) found that disturbed college students who underwent client-centered therapy made significant gains on the MMPI retest in the direction of health on six of the retest scales with the greatest differences being shown on the feeling or mood scales, while the least differences were shown on the character and behavior disorder scales. The significantly reduced scales were (F*), (Hs*), (D*), (Pt*), (Si**), (Ma**) and increase on (K*). Kaufman (1950) found D, Pt, and Sc sensitive in differentiating college students undergoing conference therapy from controls. The scales of Hy and Pd were resistant to change in the patients while K changed. Schofield (1950) also found the MMPI test-retest could be used as a measure of response to therapy as found among students referred to the neuropsychiatric hospital for treatment.

In summary, it cannot be answered from this study whether the L-F-K relationship and their significant changes by both groups on both

tests represent dissimulation or treatment changes. A future investigation into the relationship of the L-F-K should check all combinations of MMPI validation scales and personality variables of the test-retest.

A number of limitations are recognized in the above study. It can be suspected that the small number used for each group contributed to the inability to demonstrate statistical validity. It was also recognized that single predictors seldom lead to a high degree of predictive efficiency (Guilford, 1950). Also, post-dictive results such as those obtained in this study offer limited value for predictive purposes except on the population on which the predictors were derived.

SUMMARY AND CONCLUSIONS

The specific purpose of the study was to investigate the potential capacity of the MMPI test-retest to predict recidivism among a population of 220 rehabilitated male Air Force prisoners restored to duty during 1960. Two groups were selected for the study from among the population of restorees.

One group was comprised of 35 restorees who were randomly selected from among those still serving successfully in the Air Force or who had completed their tour of duty within the deadline period set for the study. A second group consisted of 35 restorees who were randomly selected from among those discharged from the Air Force under other than honorable conditions. Comparisons of MMPI test-retest mean T scores on 17 scales were made both between and within groups using "t" tests of significance for small samples. In view of the comparisons, the following conclusions appear justified:

1. ~~Hypothesis I was rejected.~~ Significant differences between the test and retest for successful restorees were found on nine scales; and, for the unsuccessful group, significant differences appear on ten scales. Excluding eight common scales, successful restorees showed significant increase on scales (L), (K), (SR), and reduction on (Mf); unsuccessful restorees revealed significant reductions on (F), (Pd), (Sc), (Si), and increase on (DO). In effect, successful restorees moved toward greater psychological health, increased social motivation, and increased masculinity interest on the second test. Unsuccessful restorees, on the other hand, moved from elevated scales associated with disorganization, character disorder, bizarre thinking, introvertiveness, and with some gain in dominance (DO).

2. ~~Hypothesis II could not be rejected.~~ The psychopathic deviate (Pd) scale was found to differentiate successful from unsuccessful restorees at the .05 level of confidence on the first test. On the second test, hysteria (Hy), differentiated the two groups at the .05 level. Since these differences could have occurred by chance, Hypothesis II was not rejected.

3. It is pointed out that both successful and unsuccessful restorees moved from a "caret ^" on the L-F-K relationship to a "V" on the retest. For successful restorees, the (F) remained relatively stable on both test-retest; for the unsuccessful group, the (F) scale dropped significantly. On the retest, the (L) and (K) raised significantly for the successful group but not for the failure group.



4. It was concluded that the MMPI test-retest differences which were found within groups offered potential capacity to predict Air Force recidivism, but that the utilization of single predictors offered limited prediction capability. The findings appear to warrant a future study should be made which would utilize more sophisticated techniques, such as multiple regression, to arrive at the best combinations of MMPI test-retest factors for more efficient prediction.



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